

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions of claims in the application:

Listing of Claims:

1. (Currently Amended) A computer-implemented database system engine in a computing system comprising:

a computer-implemented database engine further comprising:

a computer-implemented page aggregator component that operates across concurrent database transactions to obtain information on an aggregate size change that occurs on a database data page; the database data page is copied and modified by database transaction(s) that requires modification thereof; the concurrent database transactions perform sub-page level operations on a database data page;

a computer-implemented heap allocation component that employs the information on aggregate size change to determine an availability of space for the database data page;
and

a computer-implemented lock manager that enables sub page level locking across concurrent database transactions.

2-4. (Cancelled)

5. (Currently Amended) The system of ~~claim 3~~claim 1, the computer-implemented page aggregator enables a determination of space consumptions across a respective copy of database data page employed by each database transaction.

6. (Currently Amended) The system of ~~claim 4~~claim 1, the computer-implemented page aggregator determines the space consumption across the respective copy of database data page from information available in the lock manager.

7. (Cancelled)

8. (Currently Amended) The system of ~~claim 2~~ claim 1, the computer-implemented heap manager-allocation component tracks an availability of space on the database data page.
9. (Currently Amended) The system of ~~claim 2~~ claim 1, the computer-implemented heap allocation manager and the computer-implemented page aggregator enforce a set of conditions on a database transaction that operates on a ~~data page~~ database data page, such that a space availability for the database data page prior to the commit stage of the database transaction is assured.
- 10-12. (Cancelled)
13. (Currently Amended) A computer-implemented method that facilitates synchronization in concurrent database transactions comprising:
- obtaining information on an aggregate size change that occur on a database data page as a result of concurrent database transactions operating on respective copies of the database data page; and
 - tracking a space availability for the database data page over all the concurrent database transactions.
14. (Currently Amended) The method of claim 13 further comprising assigning locks to a resource on the database data page.
15. (Cancelled)
16. (Currently Amended) The method of claim 13 further comprising replacing a row of the database data page with an inserting pointer.
17. (Currently Amended) The method of claim 16 further comprising inserting the row on a new database data page.

18. (Original) The method of claim 14 further comprising storing the information in the locks.
19. (Currently Amended) The method of claim 18 further comprising discarding the locks upon at least one of a roll back of a database transaction and committing a database transaction.
20. (Cancelled)
21. (Original) A computer readable medium having stored thereon computer executable instructions for carrying out the method of claim 13.
- 22-30. (Cancelled)
31. (Currently Amended) A method for manipulating database data in a database data page by a database transaction comprising:
copying a database data page to a reserved space for the database transaction; and
determining an aggregate size change for the database data page.
32. (Currently Amended) The method of claim 31 further comprising tracking a space availability on the database data page across a plurality of concurrent database transactions working on the database data page.
33. (Currently Amended) The method of claim 31 further comprising creating a new database data page and inserting a row therein.
34. (Currently Amended) The method of claim 33 further comprising employing a pointer in the database data page to guide a query to the row in the new database data page.
35. (Currently Amended) The method of claim 31 further comprising locking a resource at a row level on the database data page.

36. (Original) A computer readable medium having stored thereon computer executable instructions for carrying out the method of claim 31.

37. (New) The method of claim 32 further comprising assuring availability of space on the database data page prior to a commit stage of the concurrent database transactions operating on the database data page to mitigate reorganization of data around the database data page at the commit stage.